

## **REQUEST FOR FURTHER EXTENSION OF SUBSTANTIAL SERVICE AND LICENSE RENEWAL EXPECTANCY SHOWINGS**

In light of recent statutory changes and for other reasons described below, PTC-220 hereby requests a waiver of and a further extension of time until December 31, 2018, to comply with the construction requirements and renewal showings required by Sections 90.769 and 90.743 of the Commission's rules for Call Signs WFPF444, WPOI701, WPOJ271, and WPFR284 ("The Nationwide Licenses") and Call Signs WPOJ281, WPVL860, WPOJ279, WPOJ280, WPOI774, and WPOI800 ("The BEA Licenses").

### **1. ABOUT PTC-220 AND POSITIVE TRAIN CONTROL**

Positive train control is designed to enhance safety in the railroad industry by preventing train collisions and other accidents along thousands of miles of track.

PTC-220 is a joint venture whose members comprise the nation's largest freight railroads: BNSF Railway Company, CSX Corporation, Norfolk Southern Corporation, Union Pacific Corporation, Kansas City Southern, Canadian National, and Canadian Pacific. PTC-220 uses the licenses for the deployment of positive train control ("PTC") networks which are based on narrowband technology that allows for efficient and intensive use of the spectrum. Positive train control is designed to enhance safety and efficiency in the railroad industry by reducing and preventing train collisions along thousands of miles of track.

The Rail Safety Improvement Act of 2008 requires PTC-220's members as well as certain other railroads to implement PTC.<sup>1</sup> The Federal Railroad Administration ("FRA") administers implementation of the *RSIA*. In October of 2015, Congress passed, and the President signed, the Positive Train Control Enforcement and Implementation Act of 2015.<sup>2</sup> The *PTC Act* extends from December 31, 2015, to December 31, 2018, the deadline for Class I railroads and railroads providing regularly scheduled intercity or commuter rail passenger transportation to construct a PTC system, with up to two additional years if needed and if certain milestones are achieved by the end of 2018.<sup>3</sup>

PTC systems require the development and installation of sophisticated hardware and software systems. Under a PTC system, a radio device onboard a locomotive transmits and receives information regarding that train's location and related data, along

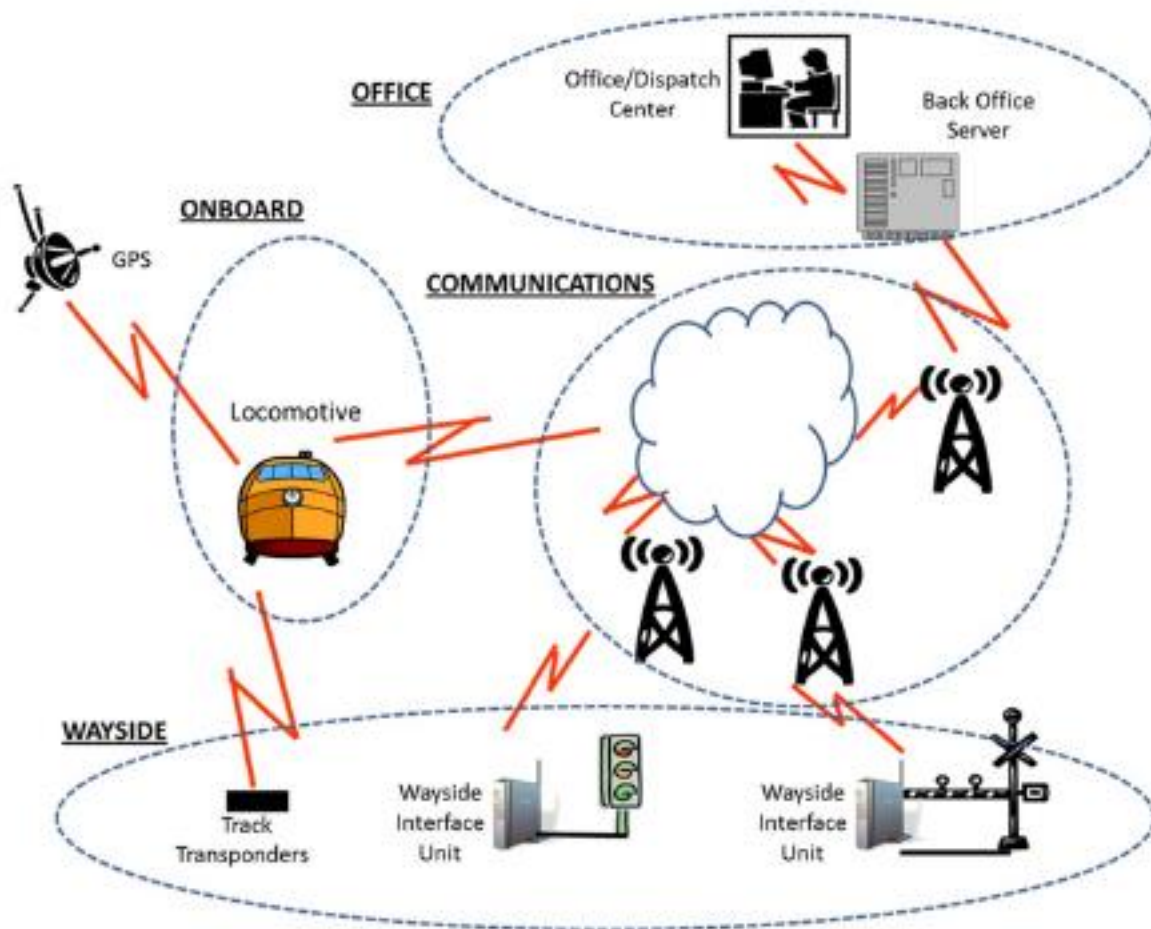
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<sup>1</sup> Rail Safety Improvement Act of 2008, Pub. L. No. 110-432, § 104, 122 Stat. 4848 (2008) ("*RSIA*").

<sup>2</sup> Positive Train Control Enforcement and Implementation Act of 2015, Pub. L. No. 114-73 § 1302, 129 Stat 568 (2015) ("*PTC Act*").

<sup>3</sup> *Id.* § 1302(b)(1)(D).

with additional information regarding where the train may travel safely. PTC systems supervise “movement authorities,” enforce speed limits, and issue alarms, among other functions. Such systems also communicate with trackside or “wayside” communications stations to obtain data regarding proper switch alignment and signals, which can be used by the PTC system to calculate locomotive speed and braking requirements. The diagram below shows the architecture of a PTC system.



Source: Federal Railroad Administration Report to Congress: Positive Train Control Implementation Status, Issues, and Impacts, dated August 2012.

The Onboard System automatically monitors the train’s speed and location with respect to the train’s area authorized for travel, also known as “authority.” The PTC Wayside Radio is used to broadcast the operational status of a railroad signal or track switch through a Wayside Status Message to PTC Locomotives. The primary use of the PTC Base Station Radio is to transmit and receive train status, movement authorities, and file transfers between the PTC Locomotive and railroad back office computer systems. The PTC Base Station Radio can also be used to extend the transmission range of the Wayside Status Message when necessary.

The FRA must issue a PTC System Certification before a railroad may operate full-fledged PTC.<sup>4</sup> Extensive engineering and testing must be completed before a railroad can request FRA certification of its PTC system by filing a PTC Safety Plan. Below is a brief description of the multi-step certification process.

- A railroad must file a PTC Implementation Plan with the FRA, which describes the scope, sequencing and implementation dates that need to be met for its PTC system and how the railroad will comply with the FRA's PTC system implementation rules.<sup>5</sup>
- In conjunction with its vendors, the railroad then develops its PTC system specifications and submits a PTC Development Plan for Type Approval to the FRA. The PTC Development Plan includes a detailed analysis of the hardware, software and subsystems that will be used in the railroad's PTC system.<sup>6</sup>
- After the railroad completes construction on a portion of its PTC network, it files a request to initiate Field Qualification Testing with the FRA. With FRA approval, the railroad begins FRA monitored Field Qualification Testing using special non-revenue service trains.
- Typically after Field Qualification Testing is completed, the railroad will then file its PTC Safety Plan with the FRA and request permission to begin Revenue Service Demonstration, where the PTC system operates on railroad revenue service trains while measuring results and looking for any critical anomalies. FRA PTC System Certification is not granted until the FRA is confident in the implementation and safe operation of the railroad's PTC system, which is based on FRA-monitored Field Qualification and Revenue Service Demonstration testing or independent third-party Verification and Validation.<sup>7</sup>
  - The PTC Safety Plan requires extensive showings and analysis of the railroad's quality control mechanisms used during the implementation of the PTC systems; safety-related procedures, testing mechanisms, and training; hazard identification and mitigation; verification and validation procedures used to assess the PTC system; and warnings in the Operations and Maintenance Manual.<sup>8</sup>

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<sup>4</sup> 49 C.F.R. § 236.1015(a) ("Before placing a PTC system required under this part in service, the host railroad must submit to FRA a PTCSP and receive a PTC System Certification.").

<sup>5</sup> 49 C.F.R. § 236.1011(a) (PTC Implementation Plan content requirements). The *PTC Act* requires railroads to file revised implementation plans that reflect the extended deadline. See *PTC Act* § 1302(b)(2)(B). The FRA has no authority to review or approve the revised plans. See Fixing America's Surface Transportation Act, Pub. L. No. 114-94 § 11315(d)(1) (2015).

<sup>6</sup> 49 C.F.R. § 236.1011(a) (PTC Development Plan requirements).

<sup>7</sup> 49 C.F.R. §§ 236.1009(f) and 236.1015(a).

<sup>8</sup> 49 C.F.R. § 236.1009(d). Based on previous submissions, the FRA estimates that PTC Safety Plan submissions will contain about "6,000 pages of highly technical information," and this is in addition to any FRA-monitored testing that was conducted. Federal Railroad Administration,

- The independent Validation and Verification process involves a determination as to whether the PTC system as constructed meets the design objectives for the system and is functioning in a way to achieve those objectives. It also includes a recommendation as to whether the PTC system is ready for revenue service (service to the public).
- Only upon receipt of PTC System Certification may the railroad use its PTC system for full commercial revenue service on railroad subdivisions.

## **2. FCC CONSTRUCTION REQUIREMENT**

Recognizing the unique circumstances of PTC-220 in light of the statutory mandate and the public safety benefits of deploying PTC, the *2009 Waiver Order* permitted PTC-220 to make a showing of substantial service by March 22, 2014, to satisfy the construction obligations for its various 220 MHz licenses.<sup>9</sup> The *2009 Waiver Order* indicated that the Commission could “consider the nationwide, integrated nature and scope of PTC-220’s positive train control network in evaluating whether the licensee has met its construction and renewal requirements,” although it noted that “[c]onstruction must occur in each individual license area, on each licensed channel block.”<sup>10</sup> The Commission subsequently granted PTC-220 an additional extension of the substantial service showing requirement deadline until December 31, 2015.<sup>11</sup>

In evaluating substantial service showings generally, the Commission has determined that it will consider such factors as whether the licensee is offering a specialized or technologically sophisticated service that does not require a high level of coverage to be of benefit to customers, and whether the licensee’s operations serve niche markets or focus on serving populations outside of areas served by other licensees.<sup>12</sup> PTC-220’s PTC service qualifies as such a specialized “niche” service given that it caters to the freight and passenger railroad industries for safety of life services, radio coverage is only required along railroad tracks, and service is not connected to the public switched telephone network.

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Report to Congress: Positive Train Control Implementation Status, Issues, and Impacts, dated August 2012 at 41, *available at* <http://www.fra.dot.gov/eLib/details/L03718> (“*FRA Report*”).

<sup>9</sup> Request of PTC-220, LLC for Waivers of Certain 220 MHz Rules, WT Docket No. 08-256, *Memorandum Opinion and Order*, 24 FCC Rcd 8537 ¶ 11 (WTB June 25, 2009) (“*2009 Waiver Order*”).

<sup>10</sup> *Id.*, ¶ 14.

<sup>11</sup> See, e.g., Application of PTC-220, LLC, Request for Extension of Time, ULS File No. 0006730056 (filed Mar. 27, 2015) (requesting an extension of time until December 31, 2015 to satisfy the FCC’s construction requirements; the application was granted on July 16, 2015).

<sup>12</sup> See Chasetel Licensee Corp., *Order*, 17 FCC Rcd 9351 (2002); see also *Cingular Interactive, L.P. Showing of Substantial Service Pursuant to Section 90.665(c)*, *Order*, DA 01-2501 ¶ 10 (WTB rel. Oct. 29, 2001).

### **3. PTC-220 HAS MADE SIGNIFICANT PROGRESS TOWARDS PROVIDING SUBSTANTIAL SERVICE ON THE LICENSES**

PTC-220 members and one non-member lessee have constructed 1,246 base stations that are in operation on one or more of the Nationwide Licenses. PTC-220 has determined that, on average, a single base station covers approximately 20 miles of railroad track.<sup>13</sup> Accordingly, the in-service base stations are providing PTC radio coverage to more than 24,920 miles of track across the country.<sup>14</sup> The attached Appendix A contains a map depicting the location of the base stations. Note that every base station uses a common control channel, which is assigned from call sign WPFR284. Thus, the level of build-out for each call sign is as follows:

<b>Call Sign</b>	<b>Operational Base Stations</b>	<b>Approx. Track Miles</b>
WPFP444	216	4,320
WPOI701	539	10,780
WPOJ271	487	9,740
WPFR284	1,246	24,920

In addition to base stations, PTC-220 members have constructed approximately 5,085 active wayside stations operating on the Nationwide Licenses. Like base stations, each wayside station uses the common control channel from WPFR284. Each wayside station also operates on one or more of the other three Nationwide Licenses. Multiple channels may be used, particularly in areas with overlapping signal coverage from more than one base station, or in dense environments where a wayside station may be reporting the status for more than one railroad infrastructure device, such as a railroad signal and a complex interlocking of multiple railroad signals and switches. The dynamic nature of the wayside stations makes it difficult to assign each station to a given call sign.

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<sup>13</sup> See Application of PTC-220, LLC, Request for Extension of Time, ULS File No. 0006730052, Appendix A (Mar. 27, 2015).

<sup>14</sup> 1246 base stations x 20 track miles = 24920 track miles. Note that the number of track miles where the PTC radios are providing communications service may be greater than the number of track miles on which full PTC service is active. The difference may be explained by the fact that railroads must have 100 percent of their base station and wayside station radios in a given railroad subdivision in operation before PTC can be placed into service on that subdivision. This explains why estimates of PTC deployment, as reported by the AAR to the FRA, may differ from the data in this report.

Thus, for purposes of this report, wayside stations are reported as being assigned to a particular call sign in direct proportion to the number of base stations assigned to that call sign, resulting in the following association of wayside stations with call signs:

Call Sign	Wayside Stations
WPFP444	970
WPOI701	1,836
WPOJ271	1,909
WPFR284	5,085

Apart from the fixed PTC infrastructure, approximately 5,538 PTC mobile radios are installed and operational on locomotives. Each mobile unit is capable of operating on any of the licenses.

Additionally, PTC-220 has made significant progress in building out its BEA Licenses. Appendix B details PTC-220's construction progress for each of its BEA Licenses, showing that some 25 base stations have been placed into operation on these licenses.

Under current FRA requirements, PTC-220 member railroads will need to deploy PTC on approximately 60,000 miles of track nationwide based upon reported PTC Route Miles in the railroads' PTC Implementation Plans filed with the FRA.<sup>15</sup> Thus, the current build-out represents 41.5% of total expected PTC coverage.

Congress recently extended the deadline for railroads to implement PTC until December 31, 2018. A number of railroads have already begun limited operations with their PTC systems with three railroads operating a revenue service PTC demonstration on certain rail lines under the supervision of the FRA. It is important to remember that the operation of PTC systems involves much more than the RF communications component. Advanced trackside signaling equipment and complex back office software are also required to ensure the safe movement of rail traffic. Obviously, the deployment of the communications component is a prerequisite that must be functioning before testing of the full system can commence. Thus, the fact that PTC service is in the testing stage in a given area necessarily indicates that the PTC *communications component* is in fact already "in service."

Different components of the PTC systems relying on the Nationwide Licenses are in operation while railroads continue working toward FRA certification of their PTC systems. Currently, constructed wayside stations and base stations are transmitting PTC messages that are being received by locomotives and back office systems. Examples of radio network usage include:

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<sup>15</sup> FRA Report at 12.

- Transmission of Wayside Status messages in locations where the installation of completed Wayside communications and signals hardware and software has been completed.
- Radio network coverage and performance testing, including measurement of base station received signal strength indication (“RSSI”) levels from moving locomotives.
- Early functional PTC field testing using railroad Hi-Rail on-track vehicles equipped with 220 radios.
- Support for railroad signal system verification and validation testing which requires transmission of Wayside Status messages.
- FRA-observed Field Qualification testing with moving locomotives on a small number of rail line subdivisions.
- FRA-approved Revenue Service Demonstration of PTC train operations on a very small number of rail line subdivisions.

#### **4. THE COMMISSION SHOULD GRANT PTC-220 AN EXTENSION OF TIME TO DEMONSTRATE SUBSTANTIAL SERVICE**

PTC-220 hereby requests a further extension of time until December 31, 2018, to comply with the construction requirements and renewal showings required by Sections 90.769 and 90.743 of the Commission’s rules.

To obtain a waiver of the Commission’s rules, an applicant must demonstrate either that: (i) the underlying purpose of the rule at issue would not be served or would be frustrated by its application, and that a waiver is in the public interest; or (ii) in view of the unique circumstances, application of the rule would be inequitable, unduly burdensome or contrary to the public interest.<sup>16</sup> Waiver is appropriate if special circumstances warrant a deviation from the general rule, and such a deviation will serve the public interest.<sup>17</sup>

As is demonstrated below, PTC-220 members have been diligent in deploying their networks, but have faced a number of delays outside of their control. Based on these challenges, an extension of time to construct until December 31, 2018, is in the public interest.

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<sup>16</sup> 47 C.F.R. § 1.925(b)(3); see also 47 C.F.R. § 1.3 (stating that the Commission can waive or suspend any portion of its rules “for good cause shown”).

<sup>17</sup> *Northeast Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990) (citing *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969)).

**a. Unique Circumstances Warrant the Waiver Grant, and Application of the Construction Deadlines Would be Inequitable, Unduly Burdensome, and Contrary to the Public Interest.**

The unique and unusual factual circumstances faced by PTC-220, when taken together, justify a limited waiver of Sections 90.769 and 90.743 because strict enforcement of the rules would be inequitable, unduly burdensome, and contrary to the public interest.<sup>18</sup>

**i. Congress Has Extended the PTC Deadline.**

In October of 2015, Congress passed, and the President signed, the Positive Train Control Enforcement and Implementation Act of 2015.<sup>19</sup> The *PTC Act* extends from December 31, 2015, to December 31, 2018, the deadline for Class I railroads and railroads providing regularly scheduled intercity or commuter rail passenger transportation to implement a PTC system, with an additional two years (to the end of 2020) if needed and if certain milestones are achieved by the end of 2018.<sup>20</sup> Throughout this period, each railroad must submit annual progress reports to the Secretary of Transportation.<sup>21</sup>

Failure to grant a further extension would be inconsistent with Congress' intent in passing the *PTC Act*.<sup>22</sup> Requiring railroads to meet their RF construction requirements far in advance of the final deadline for implementing nationwide PTC would require railroads to divert substantial resources towards one PTC component – the wireless communications network. This would be unduly burdensome, as it would prevent railroads from efficiently deploying resources, including equipment and personnel, according to whichever component of their PTC system requires the highest priority. Moreover, to the extent the FCC determines that “substantial service” in the context of PTC-220's niche service requires the operation of full revenue service, the FCC's requirement would necessarily require *all* aspects of PTC systems to be completed,

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<sup>18</sup> 47 C.F.R. § 1.925(b)(3)(ii); see also Intek License Acquisition Corp. Request for Waiver and Consolidation of 220 MHz Construction Requirements, *Memorandum Opinion and Order*, 16 FCC Rcd 16431 ¶ 10 (2001) (granting waiver of the 220 MHz construction requirements in Sections 90.725 and 90.767 on the grounds that, because Intek used its licensed facilities to build a single nationwide system, application of the various construction requirements would be unduly burdensome, and that its band manager approach would offer more diverse services).

<sup>19</sup> See generally *PTC Act*.

<sup>20</sup> *Id.* § 1302(b)(1)(D).

<sup>21</sup> *Id.* § 1303(c)(1).

<sup>22</sup> A bi-partisan group of 47 U.S. Senators sent a letter to the Senate leadership urging the Senate to “extend [the PTC] deadline in a responsible way that ensures smooth implementation of this new technology with measurable benchmarks.” See Letter from Senator Jon Tester, *et al.*, to Senator Mitch McConnell, Majority Leader, U.S. Senate, and Senator Harry Reid, Minority Leader, U.S. Senate (Sept. 30, 2015), available at [http://www.commerce.senate.gov/public/\\_cache/files/f7f15d4f-1c89-4f7b-9b7a-2ff3e80f40a1/EA4472860C7FD44289C442CE5CE22775.testers-moran-ptc-deadline-extension-9-30-15.pdf](http://www.commerce.senate.gov/public/_cache/files/f7f15d4f-1c89-4f7b-9b7a-2ff3e80f40a1/EA4472860C7FD44289C442CE5CE22775.testers-moran-ptc-deadline-extension-9-30-15.pdf).



thereby effectively undermining Congress' determination that railroads should be granted additional time to deploy PTC.

**ii. PTC Deployment along the Northeast Corridor Is Being Delayed Due to Interference Concerns and Lack of Spectrum.**

Significant interference issues remain to be resolved before PTC service can be deployed along the Northeast Corridor ("NEC"), one of the nation's busiest rail corridors. A 2014 study funded by the FRA discovered that interference would occur between freight and commuter railroads operating along the NEC within the same 220 MHz frequency band, given that freight and commuter railroads will rely on different technologies to implement PTC.<sup>23</sup> The study concluded – and field tests later confirmed – that, in order to be able to deploy traditional interference mitigation technologies such as filtering, the freight and commuter PTC operations would need to be spectrally separated by at least one megahertz. Member railroads, working through PTC-220 therefore began evaluating solutions that involve relocating the commuter railroads holding 220 MHz spectrum along the NEC to spectrum in the 217 and 218 MHz bands. These efforts are currently underway but have been complicated by the fact that spectrum covering the relevant geographic areas is not readily available on the secondary market.

To solve the interference issue in the Philadelphia area, PTC-220 has entered into an agreement for the purchase of a 218 MHz license. This transaction is expected to close in January 2016. However, not all of the commuter traffic in the area will be covered by that license. The remaining needed spectrum is held in the FCC's inventory. Thus, PTC-220 anticipates that it will file an application to modify the license to expand its geographic area (in exchange for a reduction in spectrum quantity) to cover the remaining commuter lines. In addition, certain rule waivers will be needed to make the spectrum useable for PTC. These applications will require cooperation by the relevant commuter railroads and will be subject to public review and comment. It is not known how long it will take to obtain approval of these applications.

A similar interference scenario between freight and commuter railroads exists in the greater Boston area. The 218 MHz spectrum in this area is held in FCC inventory, and both blocks of AMTS (217 MHz) spectrum are currently tied up in legal proceedings. It is impossible to determine how long it will take for this spectrum to become available.

Also in the NEC – although not related to a potential interference situation – PTC-220 has determined that its current spectrum inventory in northern New Jersey will not be adequate to fully support PTC operations in that area. PTC-220 has entered into a purchase agreement to acquire the necessary spectrum from a third party. The parties expect this transaction to close in Q1 2016.

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<sup>23</sup> The technology used by freight railroads is known as I-ETMS (or ITC), while commuter railroads have chosen ACSES as their PTC technology. There are a number of operational scenarios whereby an I-ETMS radio could desensitize the receiver of a nearby ACSES radio, and vice versa.

### **iii. International Treaty Negotiations are Delaying the Construction of PTC Systems in the Mexican Border Region.**

The current interim sharing arrangement between the United States and Mexico governing the use of the 220-222 MHz band is approximately 20 years old and, as currently written, does not permit PTC operations in the border region. After the recent formalization of Mexico's new telecommunications regulator, the *Instituto Federal de Telecomunicaciones* ("IFT"), the FCC began informal and formal coordination with Mexico on revisions to the 220 MHz cross-border agreement. On June 8, 2015, delegations from the United States and Mexico discussed shared use of the 220-222 MHz band, which is vital to PTC deployments.<sup>24</sup> Later in the summer of 2015, the FCC provided the IFT with a draft for an amended protocol concerning the allocation and use of the channels in the 220-222 MHz band along the common border. The IFT shared the proposed agreement with potential users of the spectrum, including the Mexican railroads.

In late October 2015, IFT responded to the FCC with a draft band plan for the 220-222 MHz band for the US-Mexico border region that differed in several material respects from the proposal that the United States had provided to IFT. Shortly after receiving the IFT's proposal, the FCC responded to IFT with an alternative 220-222 MHz band plan that authorized additional channels within the 220-222 MHz band for use in the border region by licensees authorized to operate in Mexico. The FCC sought feedback from IFT throughout the months of November and December of 2015, but has not, to PTC-220's knowledge, received a response. Until the IFT responds to the latest FCC proposal, and perhaps even after that response, it will remain unclear when the United States and Mexico will be able to reach an agreement that revises the current limitations sufficient to permit full deployment of PTC in the southern border region of the United States.

### **iv. Compliance with the FRA PTC Certification Process is Delaying Full Implementation of PTC Operations.**

The construction efforts of PTC-220's member railroads are operating on two parallel tracks. While the extensive engineering that is necessary for a fully-operational nationwide PTC system continues, the railroads are constructing the infrastructure and deploying the hardware that will be necessary to operate the PTC system. PTC-220's members have been able to begin functional PTC operations in some areas after receiving approval from the FRA to begin field tests.

To begin more extensive field testing, the railroads need to complete GIS surveys, the track and wayside station Verification and Validation process, and the installation of operational locomotive onboard system software and back office software. These software systems have been under continuous development and laboratory testing for many years, beginning well before the 2008 passage of the *RSIA*. However,

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<sup>24</sup> See Mindel DeLaTorre, International Bureau Chief, *Reaffirming Cross-Border Relations*, OFFICIAL FCC BLOG (June 19, 2015, 12:13 PM), <https://www.fcc.gov/blog/reaffirming-cross-border-relations>.

the required safety metrics and the necessary interoperability are proving to be more challenging to achieve than expected.

Over the last 18 months, most of the Class I railroads have been conducting FRA-approved Field Qualification Testing of the interoperable onboard system on a limited number of subdivisions. Testing revealed system defects that triggered subsequent system releases to correct the defects. These releases also had to be tested.

Similarly, only BNSF, CSX and NS have received FRA approval to begin Revenue Service Demonstration (limited commercial service) using PTC on several rail lines. The limited number of railroads with PTC systems in Revenue Service Demonstration speaks to the complexity of the subsystems needed to implement PTC. Once a railroad is ready to move forward in the FRA certification process, it must conduct FRA-monitored testing of its PTC system and a review of its PTC Safety Plan, which can take many months to complete.

Finally, the railroad industry must perform industry wide integration and interoperability testing. Interoperability requires the industry to implement an industry shared private wide area federated network. This network exchanges PTC system messages between each railroad's PTC systems. Some railroads have established federated connections, while other railroads are working to establish connections. The process of establishing federated networks is very time consuming because it requires two or more railroads to integrate their systems.

The requested extension of time to construct PTC-220's licenses will provide railroads with the necessary time to complete the Revenue Service Demonstration and industry interoperable testing to ensure compliance with FRA safety regulations.

#### **v. Technology Constraints Continue to Challenge PTC System Implementation.**

PTC-220 continues to work with its equipment vendors to refine the PTC software necessary to create interoperable PTC systems. Current network software supports basic PTC functionality but additional modifications are needed to support the FRA safety standards necessary to obtain PTC System Certification. Additional time is also needed to allow for the complexity in designing PTC systems in highly congested areas. In the Northeast, for example, the complex network design issues are hindering the completion of frequency coordination and activation of PTC radios.

PTC radio manufacturing delays continue as current demand for equipment is exceptionally high. Delivery schedules for equipment extend well into 2016 and beyond, which has scuttled plans by some railroads to complete certain PTC deployments by year end 2015.

An extension of PTC-220's construction terms until December 31, 2018, is also justified because the railroads face (non-RF) interoperable safety software availability difficulties, a factor similar to equipment delays, which the Commission has found warrants a waiver grant. In the *Havens Extension Order*, the Commission found that the 220 MHz licensees met the standards for receiving a waiver because they had no reasonable alternative for providing service due to the lack of voice equipment, and that

it would be unduly burdensome and contrary to the public interest to require licensees to use discontinued or inappropriate equipment to meet the construction requirements.<sup>25</sup> The Commission has similarly justified extension of construction deadlines for WCS and LMDS licensees, explaining that relief is warranted where licensees face unique challenges beyond their control in obtaining viable equipment but where new technology solutions are available in the near future.<sup>26</sup> Finally, the Commission granted a five-year extension of its construction deadlines to Access 220, LLC based on multiple factors, including the fact that Access 220 had obtained the licenses with only two years left in the license term and that it had made contributions to the development of 220 MHz equipment.<sup>27</sup>

**b. Grant of the Waiver and an Extension of Time is Consistent with the Underlying Purpose of the Construction Requirements and is in the Public Interest.**

Denying this request for waiver would be inconsistent with the underlying purpose of Section 90.769. The Commission implemented the 220 MHz construction rules to ensure prompt delivery of services, to prevent stockpiling and warehousing of spectrum by licensees, and to promote investment and deployment of new technologies and services.<sup>28</sup> Waiver grant is consistent with and would advance, not undermine, this stated purpose.

PTC-220 is not warehousing the spectrum, as evidenced by the fact that PTC-220's members have actively constructed its 220 MHz spectrum. Second, giving PTC-220 members additional time to meet the construction requirements will allow them to

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<sup>25</sup> Warren C. Havens Request for Waiver or Extension of the Five-Year Construction Requirement for 220 MHz Service Phase II Economic Area and Regional Licenses, *Memorandum Opinion and Order*, 19 FCC Rcd 12994 ¶ 4 (2004) ("*Havens Extension Order*").

<sup>26</sup> See Amendment of the Commission's Rules to Establish Part 27, the Wireless Communications Service, *Report and Order*, 12 FCC Rcd 10785, 10843 ¶¶ 11-12 (1997); Applications filed by Licensees in the Local Multipoint Distribution Service (LMDS) Seeking Waiver of Section 101.1011 of the Commission's Rules and Extensions of Time to Construct and Demonstrate Substantial Service, *Memorandum Opinion and Order*, 23 FCC Rcd 5894 ¶¶ 29-30 (2008) (granting LMDS licensees a four-year extension of their construction deadlines because the licensees faced economic and technical challenges to equipment development and network deployment); see also Rush Network Corp. Request for Extension of Time to Construct a 220-222 MHz Commercial Nationwide Land Mobile Radio System, *Order*, 12 FCC Rcd 9731 ¶ 5 (1997) ("*Rush Extension Order*") (granting an extension of a construction deadline due to the lack of viable equipment, stating that it would be "wasteful" to require a licensee "to follow the letter of the rule and construct a system on a nationwide scale that is not consistent with its revised plan to capitalize on the greater flexibility in uses of the 220 MHz band," and that "[s]uch a decision would needlessly require [the licensee] to spend time and money constructing facilities it is unlikely to use.").

<sup>27</sup> See Petition for Extension of Terms for 220-222 MHz Band Phase I Nationwide Licenses held by Access 220 LLC (WFP444 and WPFR284) and Other Relief or, Alternatively, for Renewal of Licenses, *Memorandum Order and Opinion*, 21 FCC Rcd 11883 ¶ 23 (2006).

<sup>28</sup> *Havens Extension Order*, ¶ 4; see also 47 U.S.C. § 309(j)(4)(B).

continue investing millions of dollars in developing an interoperable network for the deployment of PTC technology across multiple railroads.

A grant of the waiver also would further the purposes of the Commission's flexible build-out requirements for the 220 MHz band. The Commission has stated that it adopted the substantial service build-out requirements to provide flexibility to licensees, particularly in situations where they offer cutting-edge niche services.<sup>29</sup> Failure to grant this waiver request would be inconsistent with Commission policy because it would thwart efforts to deploy cutting-edge PTC technology as required by Congress,<sup>30</sup> and would be inconsistent with the Commission's mandate in Section 151 of the Communications Act to "promot[e] safety of life and property."<sup>31</sup>

Waiving the current construction requirements would be consistent with the Commission's treatment of other wireless radio licensees and, therefore, would provide regulatory parity. As past precedent demonstrates, the Commission has granted limited and sometimes multiple waivers of construction requirements for a variety of reasons, such as lack of viable equipment and/or technological challenges.<sup>32</sup>

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<sup>29</sup> Chasetel Licensee Corp., *Order*, 17 FCC Rcd 9351, 9354 (2002); see also Amendment of Part 90 of the Commission's Rules to Provide for the Use of the 220-222 MHz Band by the Private Land Mobile Radio Services, *Second Memorandum Opinion and Order and Third Notice of Proposed Rulemaking*, 11 FCC Rcd 188, 193 (1995) (stating that the Commission's primary goal in addition to promoting efficient use of the 220 MHz spectrum "is to establish a flexible regulatory framework that will . . . eliminate unnecessary regulatory burdens on both existing and future licensees," and "ensure that licenses are granted to those who value the spectrum most highly and will maximize its use to provide the best quality and variety of service to consumers").

<sup>30</sup> See 2009 Waiver Order, ¶ 12; RSIA, § 104.

<sup>31</sup> 47 U.S.C. § 151.

<sup>32</sup> See, e.g., *Havens Extension Order*, ¶ 19 (recognizing the technical constraints, scarcity of equipment, and other limitations in the 220 MHz band and granting a three-year extension of the five-year interim construction requirement for all Phase II 220 MHz licensees that timely requested relief); Comtech Communications, Inc. Request for Extension of Time to Construct a 220-222 MHz Commercial Nationwide Land Mobile Radio System, *Order*, 13 FCC Rcd 16249, 16250 (1998) (granting an extension to Comtech's four-year construction deadline because equipment to offer one-way paging services on the 220 MHz band was not commercially available); *Rush Extension Order*, ¶ 5 (granting an extension to the four-year construction deadline due to the lack of equipment that could take advantage of recent rule changes); Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band, Establishment of Rules and Policies for the Digital Audio Radio Satellite Service in the 2310-2360 MHz Frequency Band, *Order on Reconsideration*, 27 FCC Rcd 13651 ¶¶ 119-121 (2012) (restarting the construction period for wireless communications service licenses, thereby providing licensees with nearly 20 years to construct from when the licenses were auctioned in April 1997).

**c. Despite Matters Beyond PTC-220's Control, It Continues to Work Diligently to Ensure the Deployment of PTC Service**

Despite the issues beyond its control that are causing delays, PTC-220 continues to make progress in other areas:

Network Planning. PTC-220 has authorized the development of several tools to facilitate and design the 220 MHz network in support of the PTC system deployment.

- **ITCnet Planning Module ("IPM").** PTC-220 engaged Meteorcomm to design a custom extension to the commercial Mentum Planet RF prediction tool to support PTC protocols. Meteorcomm developed the IPM. This tool optimizes the frequency and TDMA time slot plans for PTC networks, and interfaces directly with the FAMS application developed by PTC-220's contractor, Transportation Technology Center, Inc. ("TTCI"). The IPM is being offered to both PTC-220 members and non-members in a hosted environment supported by InfoVista (which acquired Mentum in 2012) under contract to PTC-220. However, because the original IPM was unable to complete a slot plan for the very dense Chicago area, Meteorcomm has created (and continues to test) a stand-alone version that can analyze very large plans.
- **Cross Border Tool ("CBT").** InfoVista has developed an extension to Planet that allows an RF engineer to effectively plan network build-outs in an MTA border region where there is a need to mitigate interference from an adjacent MTA.
- **Track Stitch Tool.** PTC-220 contracted with Bartlett and West to build a tool that enables PTC railroads to stitch multiple tracks together and assign track points that contain valid message and track data to attain a credible radio slot plan when used in the IPM.
- **Automatic Measurement and Data Package ("AMDP").** PTC-220 plans to purchase 30 user licenses for AMDP. AMDP allows railroads to easily use measurement data taken from the drive testing described below, and augment it with the RF predication models to improve network quality and performance.

PTC-220 provides lessees of its spectrum access to these tools. All projects must be implemented in a consistent way to maintain system reliability. PTC-220 has developed standards for building projects, and is working with InfoVista to provide classroom training as well as webinar sessions on specific topics. To date, 45 engineers have completed the training to be certified to use the PTC-220 hosted environment.

Also important for network planning, a number of railroads are engaged in drive testing in selected areas. Drive testing compares predicted to actual signal strengths and message error rates. These tests are invaluable for fine-tuning the RF prediction models to achieve the best accuracy for PTC operations. They also help to gauge the benefits of certain RF technologies, such as antenna diversity on locomotives. PTC-

220 is continuing large-scale drive testing efforts in various topologies to optimize prediction tools over a wide variety of terrain types.

Site Preparations. Base station site preparations and construction are ongoing. PTC-220's member railroads continue to build new or prepare existing base station sites, and install base station radios. Preparatory work at existing sites includes, among other things, coverage predictions, design and installation of antenna systems, upgrading of site power systems, site pre-wiring, and backhaul design. Indeed, in addition to the operational base stations reported earlier in this filing, PTC-220 members have completed the physical installation of more than 400 additional base station radios that are awaiting channel assignments before being turned up. Likewise, there are more than 8,000 additional wayside radios that are installed but not yet operational. Finally, there are more than 3,000 locomotive radios installed but not yet operational.

Non-Member Leases. PTC-220 has entered into spectrum manager leases with non-member railroads including CalTrain, North Country Transit District, MetroLink, and Sound Transit. In addition, PTC-220 signed testing leases with Amtrak, Metra, Metro North, and the Massachusetts Bay Transportation Authority. PTC-220 is in active leasing negotiations with four other non-member railroads. The leases are an important threshold step enabling future construction by these railroads.

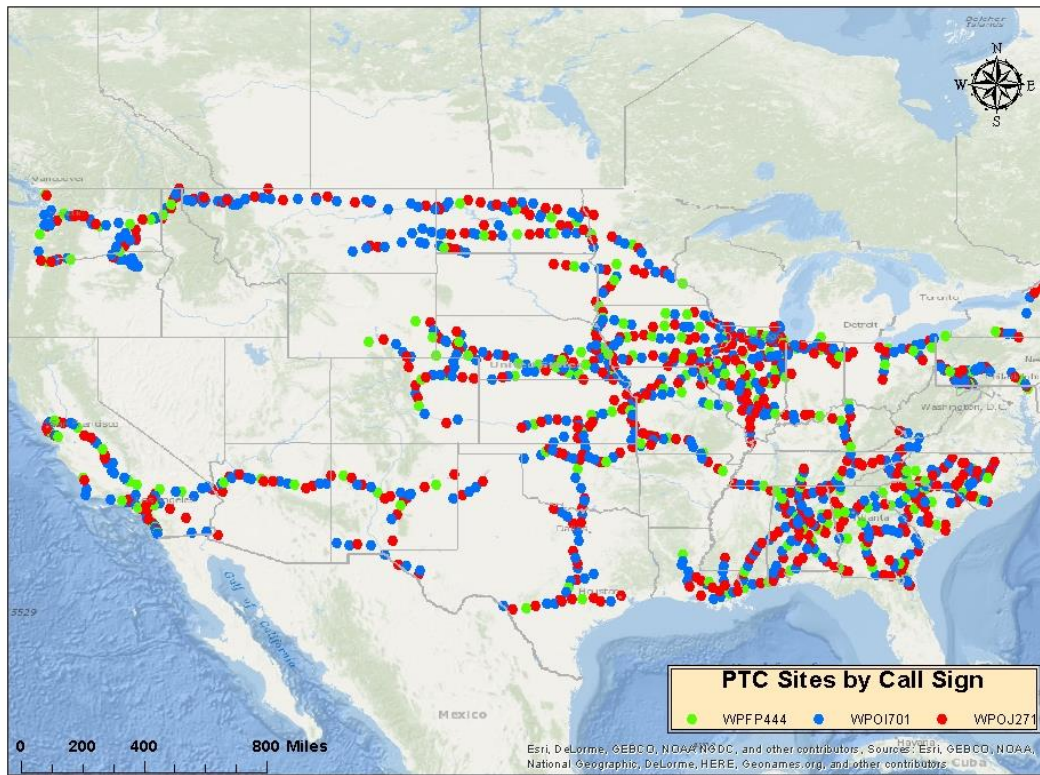
## **5. CONCLUSION**

For the foregoing reasons, PTC-220 respectfully requests that the Commission grant the further extension.

## APPENDIX A

### Base Station Construction

**2015 PTC 220 Substantial Service Map**



Note that every base station uses a common control channel, which is assigned from call sign WPFR284.

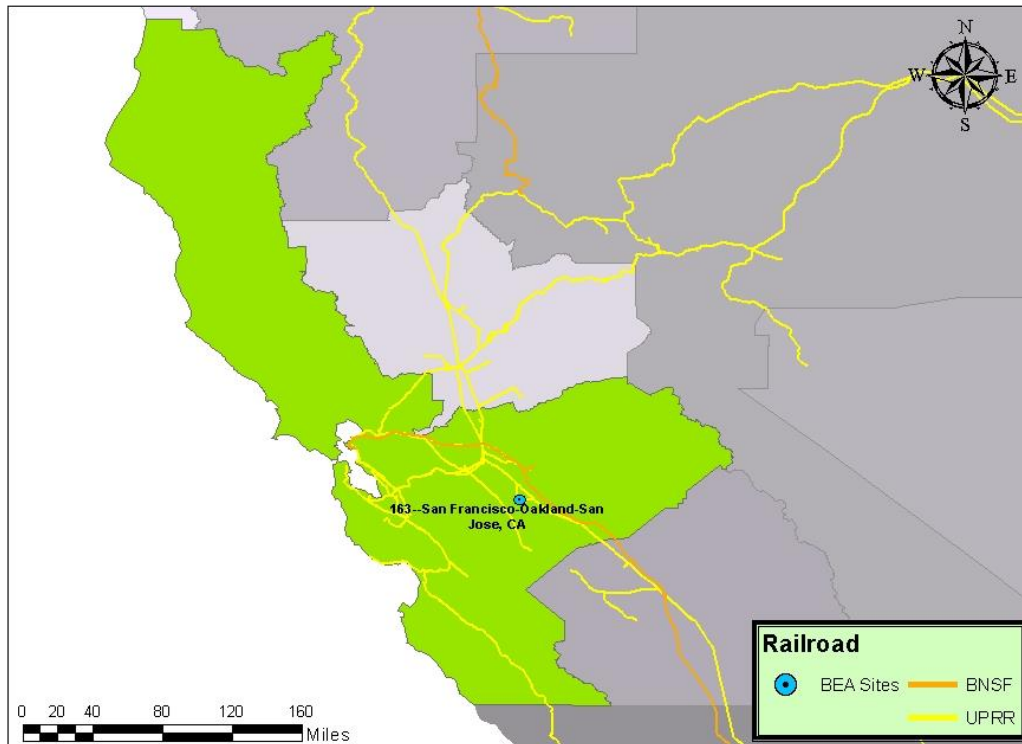


**APPENDIX B**  
**EA License Particulars and Construction Status**

<b>Call Sign:</b>	WPOJ281
<b>Market:</b>	BEA163 – San Francisco, CA
<b>Number of Constructed and Operating Base Stations:</b>	1

Due to incumbent 220 MHz Phase I operations associated with call signs WPCA460, WPCQ600, WPCJ838 and the location of PTC-220 member railroad tracks in BEA163, the only geographic area available in the BEA for PTC operations is southeast of San Francisco, CA, where a PTC-220 member has constructed and is operating one base station. See attached map.

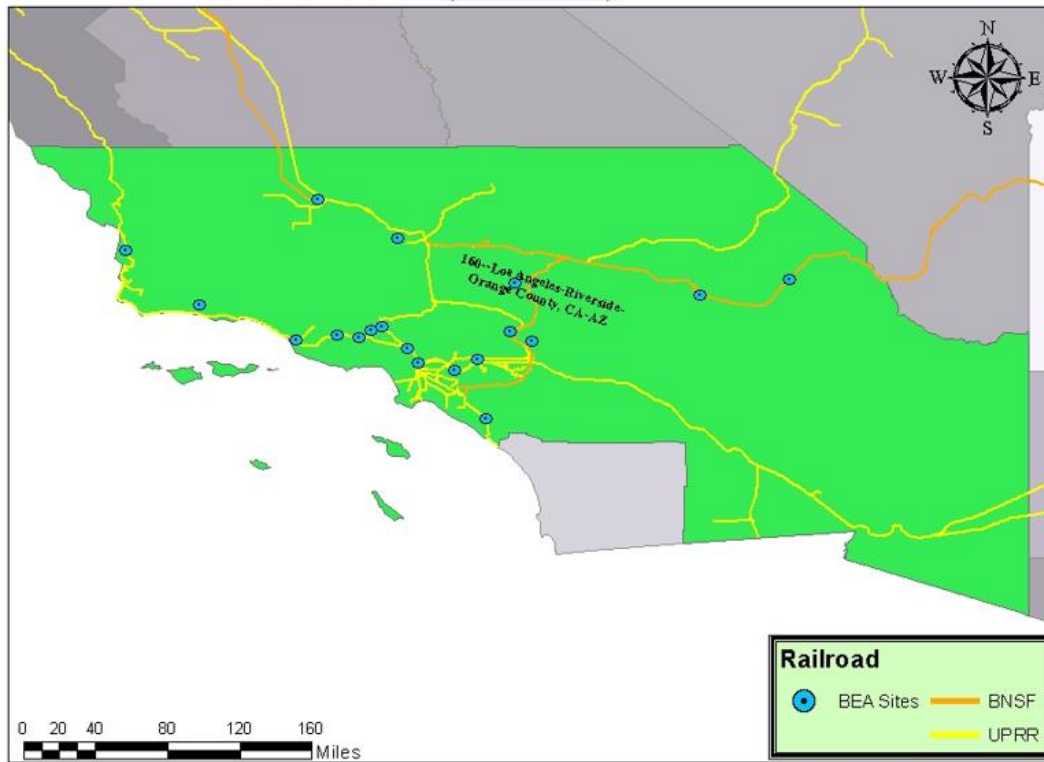
PTC220 - WPOJ281 Build-Out  
( BEA 163)



<b>Call Sign:</b>	WPLV860
<b>Market:</b>	BEA160 – Los Angeles, CA
<b>Number of Constructed and Operating Base Stations:</b>	18

PTC-220 member BNSF is operating a “boomer” base station site located on a hill above Los Angeles. From this location, BNSF’s boomer site provides PTC communications coverage to the entire Los Angeles metropolitan area. In addition there are seventeen additional sites in the greater Los Angeles metropolitan area. See attached map.

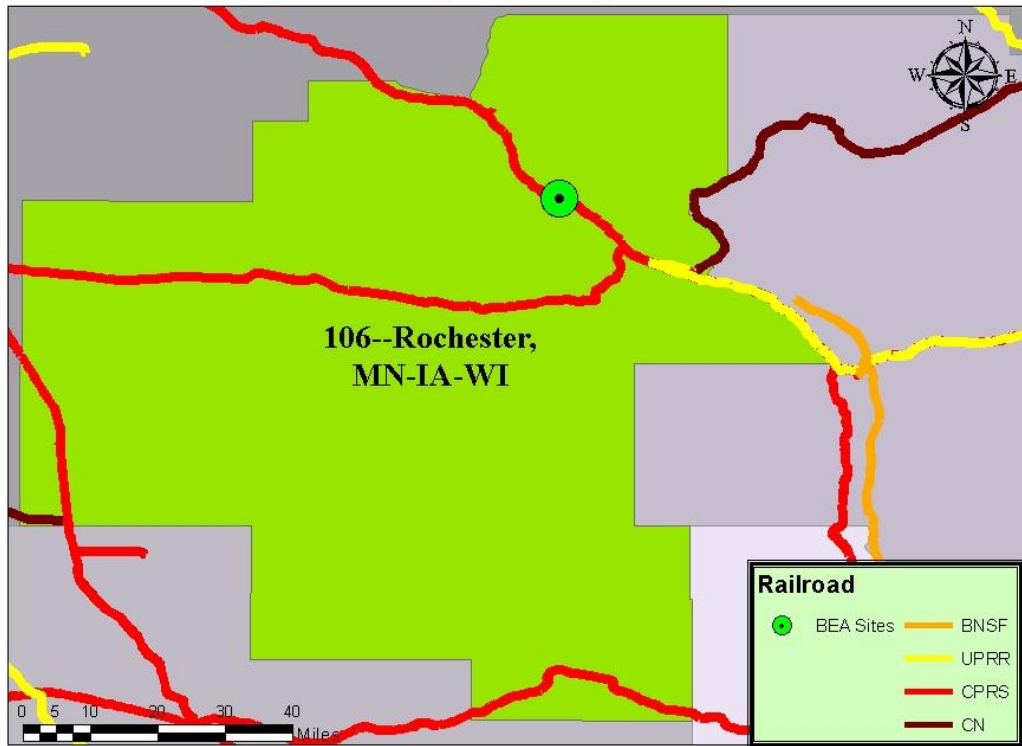
PTC220 - WPVL860 Build-Out  
(BEA 160)



**Call Sign:** WPOJ279  
**Market:** BEA106 – Rochester, MN  
**Number of Base Stations**  
**Constructed :** 1 (not yet operational)

BEA106 consists of a small geographic area containing relatively little track which is subject to PTC coverage. Radiofrequency studies indicate that there are only a few possible locations that could accommodate a PTC base station within the BEA based on signal strength predictions. The construction for the one site identified on the attached map has been completed and the radio has been installed, but is not yet in operation.

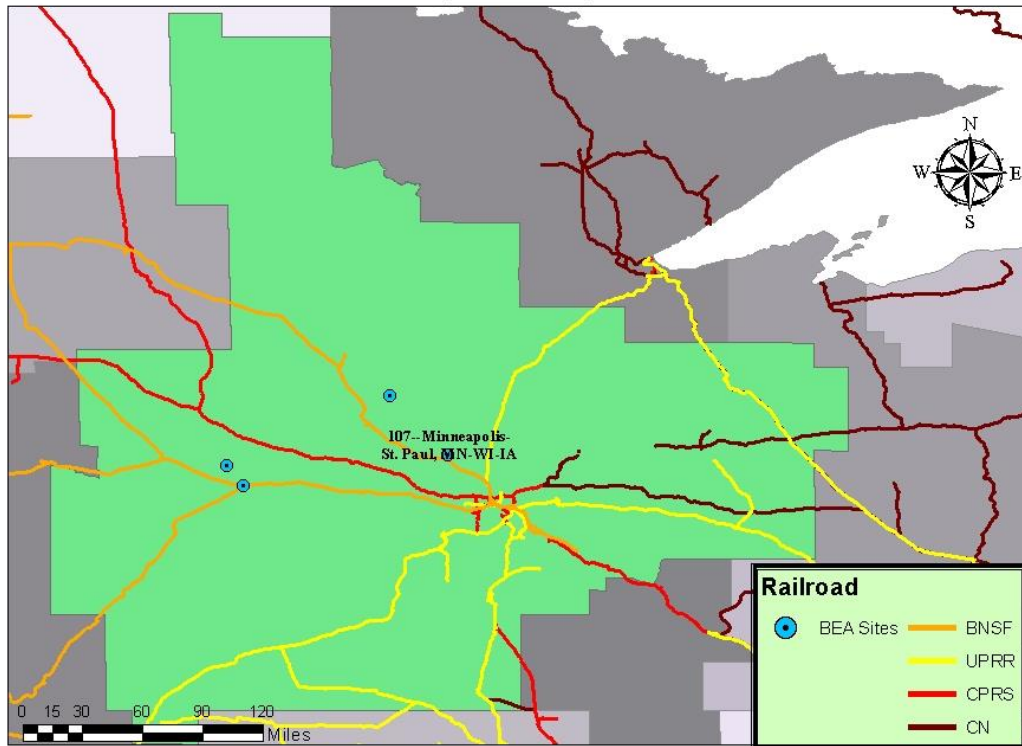
PTC220 - WPOJ279 Build-Out  
(BEA-106)



<b>Call Sign:</b>	WPOJ280
<b>Market:</b>	BEA107 – Minneapolis, MN
<b>Number of Constructed and Operating Base Stations:</b>	4

PTC-220 acquired this license to support its members' PTC operations in the congested Minneapolis-St. Paul area. It estimates that its members will need access to ten 220 MHz frequencies in order to support PTC operations in the Minnesota-St. Paul metropolitan area. At this time, a PTC-220 member has constructed and is operating four PTC base stations in the market. See attached map.

PTC220 - WPOJ280 Build-Out  
BEA 107

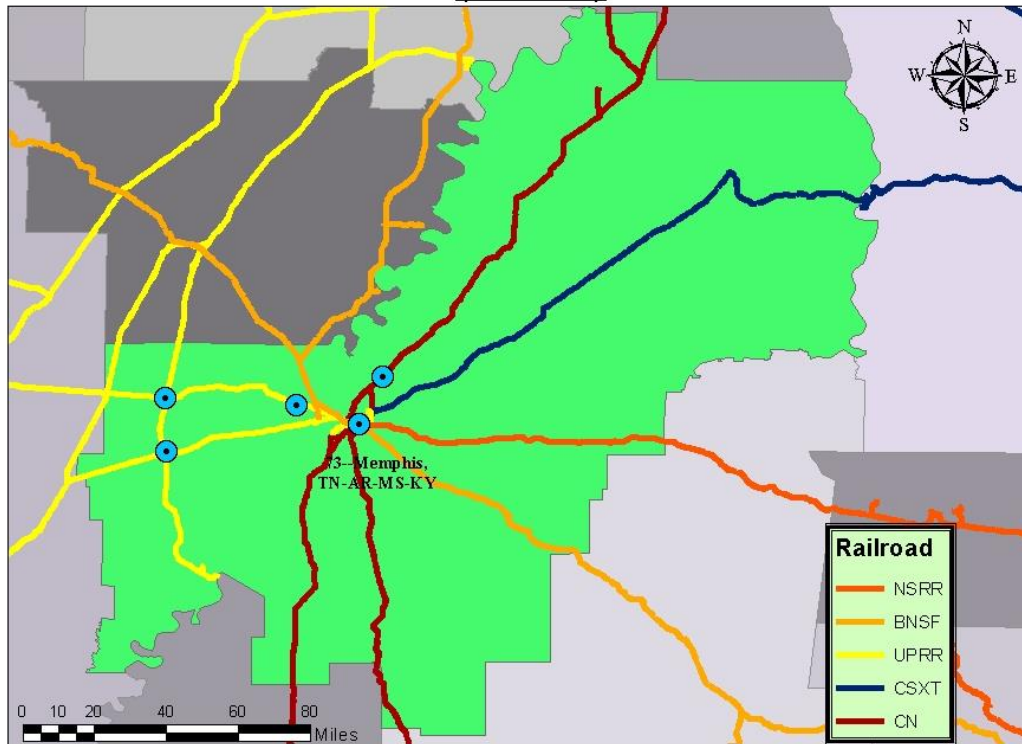




<b>Call Sign:</b>	WPOJ774
<b>Market:</b>	BEA073 – Memphis, TN
<b>Number of Constructed and Operating Base Stations:</b>	2

PTC-220 member railroad tracks receiving PTC deployment in this BEA are largely located in the northwest corner of the BEA near the border with the neighboring BEA. Due to engineering constraints to ensure that PTC base stations signals do not extend beyond the BEA boundaries, PTC-220 members are focusing their construction efforts on base stations in or near Memphis, TN. Recently, PTC-220 members completed an RF plan to use five sites in total, with three sites operating under waived operations on 221 MHz channels. While the two non-waived sites are in operation, at this time the 30-day notification period for waived operations has not been reached, and therefore construction on these sites will not occur until early 2016. See attached map showing both the constructed and pending sites.

PTC220 - WPOI774 Build-Out  
(BEA 73)



<b>Call Sign:</b>	WPOI800
<b>Market:</b>	BEA096 – St. Louis, MO
<b>Number of Constructed and Operating Base Stations:</b>	1

Construction in this market has been delayed because the dense urban design plan for the St. Louis, MO metropolitan area needs to be revised to resolve a wayside station interference issue. Currently, work is underway and expected to be completed in 2016. Of the four planned base stations, one is constructed and operational.

PTC220 - WPOI800 Build-Out  
(BEA-96)

